

NORTHERN PIPELINE  
SOCIO-ECONOMIC AND ENVIRONMENTAL  
TERMS AND CONDITIONS FOR  
THE SWIFT RIVER PORTION OF THE PIPELINE  
IN THE PROVINCE OF BRITISH COLUMBIA  
INCLUDING  
ENVIRONMENTAL GUIDELINES

Northern Pipeline Agency

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(i)

## INTRODUCTION

This document contains social, economic, and environmental terms and conditions which, under the provisions of the Northern Pipeline Act, have been attached by an Order in Council of January 29, 1981 to the Certificate of Public Convenience and Necessity granted to Foothills Pipe Lines (South Yukon) Ltd. for the construction and operation of the Swift River portion of the Alaska Highway Natural Gas Pipeline in the Province of British Columbia. These terms and conditions reflect several objects of the Act, including:

- (a) facilitating the efficient and expeditious planning and construction of the pipeline;
- (b) minimizing any adverse social and environmental impacts on the areas most directly affected by the pipeline; and
- (c) maximizing the social and economic benefits of this project for the people of the area.

The purpose of these terms and conditions is to give the company direction as to what standards of performance it must achieve in constructing and operating the pipeline. With one exception, they will replace the environmental and socio-economic undertakings made by Foothills before the National Energy Board hearings on the northern gas pipeline insofar as they apply to Foothills Pipe Lines (South Yukon) Ltd. in respect of the Swift River portion of the pipeline. Foothills Pipe Lines (South Yukon) Ltd. is required to implement the Foothills' undertaking to compensate for hunting and trapping losses due to pipeline activities.

The terms and conditions set out several environmental and socio-economic objectives which the company must attain in the construction and operation of the pipeline. Many of them are cast in general terms and will be interpreted by the Agency in the light of experience gained by the National Energy Board and the Province of British Columbia in regulating the construction and operation of gas pipelines in British Columbia. Successful construction of many pipelines in the Province over the years has resulted in a wealth of knowledge about the types of adverse impacts which can be anticipated and how best to avoid or mitigate them. Provincial standards are therefore employed in most instances.

(ii)

Two other points were recognized in the development of these terms and conditions:

(a) that the minimization of adverse social or environmental impacts can best be achieved during planning and design of the pipeline, rather than after construction is under way; and

(b) that the Agency, in assessing Foothills' compliance with the terms and conditions, must exercise professional judgement in determining the degree of minimization of adverse impacts that the company must achieve.

Under the terms and conditions the company is required to submit a series of plans for the approval of the designated officer indicating how it intends to proceed. These plans are available to the public in the offices of the Northern Pipeline Agency.

This document contains a section of environmental guidelines. The company is expected to bear these guidelines in mind when planning, designing, building, and operating the pipeline and the Agency will be guided by them in carrying out its regulatory function. In some cases the environmental concern will be the predominant factor in a decision; in such cases the Agency will normally expect the company to follow these guidelines. In other cases the environmental concern may be relatively minor in comparison with engineering, economic or social factors; in these cases the Agency will accept plans and actions appropriate to the particular situation. This section will guide both the Agency and the company in obtaining the best results practicable - a goal which cannot be obtained either by use of inflexible standards or by the absence of any standards.

This document was prepared as a result of discussions between representatives of the Province of British Columbia and officials of the Northern Pipeline Agency. Comments and advice were also received from Foothills Pipe Lines (South Yukon) Ltd., and federal government agencies.

SOCIO-ECONOMIC AND ENVIRONMENTAL  
TERMS AND CONDITIONS  
FOR THE SWIFT RIVER PORTION  
OF THE PIPELINE

THE SOCIO-ECONOMIC AND ENVIRONMENTAL  
TERMS AND CONDITIONS IN RESPECT OF THE CERTIFICATE  
OF PUBLIC CONVENIENCE AND NECESSITY DECLARED  
TO BE ISSUED UNDER SUBSECTION 20(1) OF THE  
NORTHERN PIPELINE ACT TO FOOTHILLS PIPE  
LINES (SOUTH YUKON) LTD. IN RESPECT OF  
THE SWIFT RIVER PORTION OF THE PIPELINE  
IN THE PROVINCE OF BRITISH COLUMBIA

Short Title

1. These terms and conditions may be cited as the Northern Pipeline Socio-Economic and Environmental Terms and Conditions for the Swift River Portion of the Pipeline in the Province of British Columbia.

Interpretation

2. (1) In these terms and conditions,

"Act" means the Northern Pipeline Act;

"agricultural land" means any land that is

- (a) cleared and used for pasture,
- (b) under cultivation, or
- (c) part of an agricultural land reserve;

"agricultural land reserve" means a reserve of land established under section 8 of the Agricultural Land Commission Act (British Columbia);

"big game animals" means "big game" as defined in the Wildlife Act (British Columbia);

"borrow pit" means a site used for the extraction of granular material and fill and the excavation resulting from such extraction;

"construction" means, in respect of the building of the pipeline or any portion thereof, those field activities carried out by Foothills from the commencement of the clearing for the pipeline or any portion thereof until leave to open the pipeline or portion thereof, as the case may be, is granted by the Board but does not include clearing for survey lines by Foothills;



"environmental impact" means any change in the existing physical or biological conditions of the environment resulting from the construction or operation of the pipeline;

"facility" means any fixed installation of a temporary or permanent nature installed by Foothills as a part of the pipeline or that is used by Foothills in the construction or operation of the pipeline;

"fish" means "fish" as defined in the Fisheries Act;

"Foothills" means Foothills Pipe Lines (South Yukon) Ltd.;

"fuel" means all liquid and gaseous hydrocarbons and petroleum products used in the construction and operation of the pipeline;

"fur-bearing animals" means "fur-bearing animals" as defined in the Wildlife Act (British Columbia);

"grazing reserve" means a grazing reserve established under the Land Act (British Columbia) for the purpose of grazing livestock;

"hazardous material" means any chemical, explosive, toxic material or other substance that, if spilled, misused or allowed to escape, may cause significant damage to the environment;

"inspection" means observation and measurement by Foothills to verify that

- (a) the construction and operation of the pipeline accord with the designs and specifications of the pipeline, and
- (b) these terms and conditions are complied with;

"monitoring" means data gathering, data analysis and interpretation and data presentation to determine magnitudes and characteristics of environmental change;

"operation" means any field activity by Foothills relating to the pipeline or any portion of the pipeline for which leave to open has been granted;

"Province" means the Province of British Columbia;

"rare and endangered species" means those animal or plant species that occupy areas or exist in numbers so small that, in the opinion of the designated officer, their existence would likely be threatened by the construction or operation of the pipeline;

"Swift River portion" means that portion of the pipeline within Zone 2 Foothills Pipe Lines (South Yukon) Ltd., as described in Annex II of the Agreement, that lies within the Province;

"waste" means discarded or abandoned liquid or solid matter including human waste, garbage, oil drums, petroleum products, ashes and equipment;

"waterbodies" means lakes and ponds and permanent and intermittent rivers and streams and their beds;

"wildlife" means

(a) big game animals and fur-bearing animals that are native to the Province,

(b) migratory game birds as defined in the Migratory Birds Convention Act,

(c) all Galliformes native to the Province,

(d) all species of the orders Falconiformes and Strigiformes, and

(e) rare and endangered species of birds, mammals, reptiles and amphibians.

(2) All other words and expressions have the meaning assigned to them in the Act.

### Application

3. These terms and conditions are added to the terms and conditions set out in Schedule III to the Act and shall apply to Foothills but, unless the context otherwise requires, shall only apply to the construction and operation of the pipeline in the Swift River portion of the pipeline.

### GENERAL

### Compliance with the Law

4. Foothills shall, in the construction and operation of the pipeline, comply with the laws of Canada and the laws of the Province.

5. (1) Subject to subsection (2), Foothills shall, when entering into any contract with a contractor for the construction, operation or maintenance of the pipeline, require as a condition of such a contract that the contractor or any subcontractor of that contractor observe and comply with these terms and conditions.

(2) Where an application is made by Foothills to the designated officer to exempt Foothills from the requirement referred to in subsection (1) in respect of the observing of or compliance with any provision of Part I, the designated officer may exempt Foothills from that requirement in respect of that provision.

(3) Foothills shall be responsible for any breach of these terms and conditions by a contractor referred to in subsection (1) or any subcontractor of that contractor as if the breach had been committed by Foothills.

#### Assistance to the Designated Officer

6. When requested by the designated officer, Foothills shall give him any reasonable assistance that he may require to carry out his duties in respect of the pipeline and shall furnish him with such information in respect of the construction and operation of the pipeline as he may request.

#### Access to Right-of-Way of Pipeline

7. Employees or agents of the government of the Province shall, for the purpose of carrying out their duties in connection with the pipeline, be allowed reasonable access to any part of the right-of-way of the pipeline or to any other area where the pipeline is being or is to be constructed.

#### Indemnification

8. Foothills shall, at all times, save harmless and indemnify and keep Her Majesty indemnified against all claims, demands, actions, and costs or other legal proceedings made or brought against Her Majesty by reason of or arising out of

(a) the construction or operation of the pipeline;

(b) the escape, ignition or explosion, for any cause, of gas or related hydrocarbons from or in the pipeline on the lands of Her Majesty;

(c) any act or omission on the part of Foothills, its contractors and their subcontractors and its or their officers, servants, agents or employees in respect of or in relation to the pipeline on the lands of Her Majesty; and

(d) any act or omission on the part of any officer, servant, agent or employee of Her Majesty in respect of or in relation to the pipeline on the lands of Her Majesty, not including such acts or omissions as would in law constitute gross negligence.

9. Foothills shall, at all times, pay to Her Majesty the amount of any loss or damage that has been suffered or sustained by Her Majesty by reason of or arising out of the matters set out in section 8.

#### Emergency Measures

10. Foothills shall establish emergency procedures satisfactory to the designated officer to deal with any emergency arising from the construction or operation of the pipeline that may adversely affect the environment or persons who reside in the vicinity of the pipeline.

11. Foothills shall, to the satisfaction of the designated officer, designate and train persons working on the pipeline to carry out the emergency procedures referred to in section 10.

12. Where any emergency arises in the course of the construction or operation of the pipeline, Foothills shall forthwith advise the designated officer of the emergency and of the measures it has taken or intends to take to deal with it.

PART I

SOCIO-ECONOMIC TERMS AND CONDITIONS

Undertakings

13. Where Foothills gives an undertaking to any government, council, community or organization referred to in section 17 during consultations required by that section and the undertaking is accepted by that government, council, community or organization, Foothills shall, unless otherwise directed by the designated officer within thirty days of the giving of the undertaking, comply with that undertaking.

Plans

14. (1) Subject to subsection (2), where, pursuant to this Part, Foothills is required to submit a plan in respect of any matter to the designated officer for approval, that plan, when approved, constitutes Foothills' plan for that matter and Foothills shall comply therewith.

(2) The designated officer may, on giving Foothills reasonable notice in writing, modify or vary any provision set out in a plan referred to in subsection (1) and Foothills shall comply with the plan as so modified or varied.

Plan Schedule

15. (1) Foothills shall, at such date as may be fixed by the designated officer, submit to the designated officer a plan schedule that sets out the date on which each plan referred to in subsection 14(1) is to be submitted to the designated officer.

(2) The plan schedule referred to in subsection (1), when approved by the designated officer, constitutes Foothills' plan schedule and Foothills shall comply therewith.

(3) The designated officer may, at the request of Foothills, modify or vary the plan schedule referred to in subsection (2).

Information, Consultation and Liaison

16. (1) Foothills shall cause information to be provided in respect of the planning and construction of the pipeline to

- (a) the Government of Canada,
- (b) the government of the Province,
- (c) the Northern British Columbia Advisory Council,
- (d) communities situated in the vicinity of the Swift River portion of the pipeline and the communities of Teslin and Watson Lake in the Yukon Territory, and
- (e) organizations of native people that, in the opinion of the designated officer, have a traditional or cultural interest in the Swift River portion of the pipeline

on the request of that government, council, community or organization except a community or organization that does not have, in the opinion of Foothills or the designated officer, a bona fide need for the information.

(2) The information referred to in subsection (1) shall be provided in a form and manner satisfactory to the designated officer and shall include information in respect of

- (a) the route alignment and construction schedules of the pipeline;
- (b) the potential opportunities resulting from the construction of the pipeline for the residents in the vicinity of the pipeline;
- (c) the proposed use of any land or waterbody;
- (d) any significant adverse environmental impact resulting from the construction of the pipeline; and
- (e) any other matter specified by the designated officer.

17. Foothills, when requested by the government of the Province, the Northern British Columbia Advisory Council, communities in the vicinity of the Swift River portion of the pipeline, the communities of Teslin and Watson Lake in the Yukon Territory and organizations of native people referred to in paragraph 16(1)(e), shall liaise and consult with that government, council, community or organization to facilitate the objects of the Act.

18. Foothills shall facilitate public access to the information referred to in section 16.

19. Where a public meeting, workshop or seminar is convened in a community in the vicinity of the pipeline for the purpose of disseminating information in respect of the Swift River portion of the pipeline, Foothills shall, when directed by the designated officer, make available informed persons to assist in the dissemination of such information.

20. (1) Where Foothills receives a direction from the designated officer to consult with the government of the Province, an organization of native people in the Province or the Yukon Territory or with any community situated in the vicinity of the Swift River portion of the pipeline in respect of any matter in connection with the construction or operation of the pipeline, Foothills shall, within thirty days of receiving such direction, consult with that government, organization or community.

(2) Foothills shall report to the designated officer the significant results of any consultation pursuant to subsection (1).

21. Where Foothills, at any time, consults with any contractor or labour organization in respect of any matter critical to construction progress, Foothills shall report the significant results of such consultation to the designated officer.

22. Foothills shall identify and make available a person or persons to assist Foothills in

- (a) disseminating the information referred to in section 16;
- (b) arranging consultations; and
- (c) performing any liaison function that may be required.

#### Orientation of Employees

23. Foothills shall, in respect of those persons who commence work on the construction of the pipeline, carry out an orientation program that includes environmental information to assist such persons to become familiar with the area through which the pipeline passes and their working conditions and to become aware of the potential for damage to the environment.

### Transportation and Logistics

24. Foothills shall, during the construction of the pipeline, endeavour in its use of transportation facilities not to disrupt transportation services in the vicinity of the Swift River portion of the pipeline.

25. Foothills shall bear the cost of any additional transportation infrastructure provided, at the request of Foothills, by the Government of Canada or the government of the Province for the construction of the pipeline and, where practical, shall ensure that such infrastructure is built, maintained and disposed of to provide maximum long-term benefit to those communities affected by the additional transportation infrastructure.

26. Foothills shall submit to the designated officer for his approval a plan, to be known as the transportation and logistics plan, that sets out the manner in which Foothills intends to carry out the provisions of sections 24 and 25.

### Telecommunications

27. Foothills shall ensure that, where practical,

- (a) the use by Foothills of telecommunication services for the pipeline does not adversely affect the telecommunication services in the Province; and
- (b) any telecommunication infrastructure Foothills requires for the construction of the pipeline is built and maintained in such manner as to improve the existing telecommunication services.

### Protection of Highways and Public Utilities

28. Foothills shall consult with the governments of the Province and the Yukon Territory and those regulatory authorities in the Province and the Yukon Territory having jurisdiction over roads, highways and public utilities in respect of the proposed pipeline construction for the purpose of devising means to avoid any damage to any road, highway or public utilities.



Health

29. Foothills shall ensure that the health of all persons employed on or in connection with the construction of the pipeline is safeguarded by the implementation of generally accepted public health standards.

Security

30. Foothills, in consultation with the Government of Canada, the government of the Province and the Royal Canadian Mounted Police, shall

- (a) maintain security of the pipeline;
- (b) provide physical security in respect of each campsite or worksite established by Foothills and the building and property of Foothills; and
- (c) provide, at reasonable cost, all goods and services requested by the Royal Canadian Mounted Police, the Sheriffs' Services of the Province and any other peace officers that are required by them to carry out their duties in connection with the pipeline, including
  - (i) transportation to remote or isolated locations if the means of transportation are not available to the Royal Canadian Mounted Police, the Sheriffs' Services or the peace officer making the request;
  - (ii) accommodation, including accommodation for prisoners, office space and storage facilities for police supplies and equipment;
  - (iii) such access and use of communications equipment and facilities of Foothills as the Royal Canadian Mounted Police, the Sheriffs' Services or other peace officers may require; and
  - (iv) such goods or services as are necessary for the maintenance of reasonable living standards, having regard to local conditions.

31. For the purpose of promoting effective law enforcement in the vicinity of the pipeline, Foothills, in consultation with the Royal Canadian Mounted Police and the government of the Province shall

- (a) provide the Royal Canadian Mounted Police and Sheriffs' Services of the Province with immediate access to the pipeline and

to persons employed in the construction or operation of the pipeline;

(b) establish methods, including appropriate identification practices, to facilitate the recovery of equipment or supplies belonging to Foothills that have been lost or stolen;

(c) prohibit access to any campsite established by Foothills by any unauthorized person;

(d) designate a person to whom all policing matters are to be referred; and

(e) provide sufficient information to enable the Royal Canadian Mounted Police to establish

(i) the nature and extent of the policing required on the pipeline;

(ii) a working arrangement between Foothills' security personnel and the Royal Canadian Mounted Police; and

(iii) a system of reporting on policing matters.

32. Foothills shall not permit the possession by any person employed in the construction of the pipeline of a firearm or game-hunting device

(a) on any portion of the pipeline right-of-way where construction activity has commenced, or

(b) at any time in a campsite established by Foothills or on any property, vehicle or aircraft of Foothills

unless authorized, in writing, by the designated officer.

#### Surveillance, Inspection and Monitoring

33. Foothills shall ensure the maintenance and availability, for examination at any time by the Agency, of such of its records pertaining to its activities in the Province as may be required by the Agency to determine compliance with this Part.

34. Foothills shall report to the Agency, at such times as may be required by the designated officer, on the measures that have been taken by Foothills in complying with this Part.

35. (1) Foothills, when directed by the designated officer, shall undertake special studies of the socio-economic impact of the pipeline.

(2) Every special study referred to in subsection (1) shall be forwarded to the Agency on its completion.

36. Foothills shall

- (a) establish procedures and allocate resources for the purpose of assessing the effectiveness of its compliance with this Part; and
- (b) on the request of the designated officer, assess the effectiveness of its compliance with this Part and report the assessment to the Agency.

Compensation for Damage to Property

37. Foothills shall be liable for any damage to property directly or indirectly caused by Foothills, a contractor of Foothills or a subcontractor of that contractor in connection with or resulting from its activities in the construction or operation of the pipeline.

38. Where, in the course of construction or operation of the pipeline, any damage is either directly or indirectly caused by Foothills, a contractor of Foothills or a subcontractor of that contractor, to any property, other than the property of Foothills, a contractor of Foothills, or a subcontractor of that contractor, Foothills shall

- (a) immediately take action to prevent further damage;
- (b) immediately inform the owner of the property of the nature of the damage; and
- (c) arrange, as soon as possible, for
  - (i) compensation,
  - (ii) the repair of the damage, or
  - (iii) the replacement of the damaged property.

39. Foothills shall submit to the designated officer, in a manner determined by him, information in respect of any unresolved matter referred to in paragraph 38(c).

40. Where

- (a) Foothills and a claimant against Foothills fail to agree as to liability or compensation for damage for which the claimant alleges Foothills is responsible; and

(b) the claimant referred to in paragraph (a) agrees with Foothills

- (i) to enter into an arbitration submission governed by the provision of the Arbitration Act (British Columbia), and
- (ii) that a decision of the arbitrator is binding and conclusive,

Foothills shall enter into such arbitration submission and shall pay all costs of and incidental to any arbitration proceedings pursuant thereto except where the arbitrator determines that the claim is frivolous.

#### Protection of Native Traditional Harvesting and Cultural Areas

41. (1) Foothills shall, following consultation with the government of the Province and those organizations of native people that, in the opinion of the designated officer, have a traditional or cultural interest in the Swift River portion of the pipeline, submit to the designated officer, in a manner and form satisfactory to him, an inventory that sets out

- (a) the hunting, trapping and fishing areas used by native people in the vicinity of the Swift River portion of the pipeline, and
- (b) any area of cultural importance to native people in the vicinity of the Swift River portion of the pipeline, and

a resource use analysis of the hunting, trapping and fishing areas.

(2) The resource use analysis referred to in subsection (1) shall consist of information on the seasonal use of hunting, trapping and fishing areas and statistics as to the number and types of species hunted, trapped or fished.

42. In locating the pipeline or any portion thereof, Foothills shall, following consultation with the government of the Province and those organizations of native people referred to in section 41, minimize, to the satisfaction of the designated officer, interference with the hunting, trapping and fishing areas and areas of cultural importance set out in the inventory referred to in that section.

43. In proposing the construction schedule in respect of the pipeline or any portion thereof, Foothills shall, following

consultation with the government of the Province and those organizations of native people referred to in section 41, include in the submission the measures Foothills intends to take to minimize, to the satisfaction of the designated officer,

- (a) any conflict with the seasonal use of hunting, trapping and fishing areas, and
- (b) the disturbance of areas of cultural importance set out in the inventory referred to in section 41.

44. Foothills shall, if directed by the designated officer, submit to him for his approval a plan, to be known as the traditional resource protection plan, that sets out the manner in which Foothills intends to carry out the provisions of sections 42 and 43.

## PART II

### ENVIRONMENTAL TERMS AND CONDITIONS

#### General

45. Foothills shall

- (a) plan and construct the pipeline efficiently and expeditiously; and
- (b) minimize to the extent possible any adverse environmental impact.

46. Where, in this Part, Foothills is required to make plans, take measures and implement procedures in respect of the environment, Foothills shall

- (a) incorporate in such plans, measures and procedures those environmental practices ordinarily followed in constructing and operating pipelines in the Province; and
- (b) comply with those standards established under the laws of the Province that are applicable to any pipeline constructed and operated under the laws of the Province except where such standards are inconsistent with the Act, any terms and conditions made thereunder or any other law of Canada.

Terrain, Landscape and Waterbodies

47. Foothills shall, in the planning and construction of the pipeline, minimize, to the satisfaction of the designated officer, any adverse environmental impact on land through which the pipeline passes and on waterbodies or groundwater in the vicinity of the pipeline.

48. Where Foothills proposes a location of the pipeline or a portion thereof to the designated officer for approval, Foothills shall, in a manner satisfactory to the designated officer, take into account the effect, if any, of the construction or operation of the pipeline on the existing or potential uses of any land or waterbody through which the pipeline is proposed to pass.

Permafrost and Frozen Ground

49. Foothills shall, in the construction and operation of the pipeline, take measures satisfactory to the designated officer to minimize to the satisfaction of the designated officer any change in the existing physical or biological conditions arising from the consequences of thaw settlement.

50. Foothills shall inspect, to the satisfaction of the designated officer, the implementation of the measures referred to in section 49 and shall, when requested by the designated officer, monitor to the satisfaction of the designated officer, the effectiveness of those measures.

Drainage, Erosion Control and Revegetation

51. Foothills shall, in the planning and construction of the pipeline, take such measures as are satisfactory to the designated officer to

- (a) minimize disturbance of erosion-sensitive terrain, and
- (b) minimize construction on erosion-sensitive terrain during periods in which erosion is most likely to be initiated.

52. Foothills shall design and implement erosion control measures satisfactory to the designated officer in respect of those areas

through which the pipeline passes to minimize any interference with any other use of land or water and to protect the environment.

53. Foothills shall, in the construction and operation of the pipeline, minimize, to the satisfaction of the designated officer, the development of subsurface channels along the pipeline and

- (a) any change in the natural drainage patterns, and
- (b) any increase in the sediment loading in waterbodies

of those areas through which the pipeline passes.

54. Foothills shall implement such measures as are satisfactory to the designated officer to rehabilitate land disturbed by the construction or operation of the pipeline.

55. Foothills shall take measures to revegetate land, other than agricultural land, to the satisfaction of the designated officer, disturbed by the construction or operation of the pipeline in a manner that complements any other measure Foothills takes to control drainage and erosion.

56. Where land is to be rehabilitated pursuant to section 54 or revegetated pursuant to section 55, Foothills shall rehabilitate or revegetate, as the case may be, the land in a manner consistent with present land use practices employed in that portion of the Province through which the pipeline passes and shall give priority to the following objectives:

- (a) the control of erosion and its impacts,
- (b) the protection or enhancement of important wildlife habitat,
- and
- (c) the restoration of the aesthetic value of the land

and such priority shall be given in the order set out in paragraphs (a) to (c).

57. Where Foothills has backfilled any part of the pipeline under construction, Foothills shall, unless otherwise authorized by the designated officer, commence as soon as practicable but, in any event, within one year of the backfilling, the erosion control measures referred to in section 52, the rehabilitation measures referred to in section 54, and the revegetation measures referred to in section 55.

58. Foothills shall,

- (a) where a revegetation measure referred to in section 55 is taken that involves the seeding of land, use only seed mixes acceptable to the government of the Province;
- (b) take such measures as are satisfactory to the designated officer to minimize the entry of noxious weeds into the area through which the pipeline passes on construction equipment used by Foothills; and
- (c) take such measures as are satisfactory to the designated officer to control infestations of noxious weeds caused by the construction of the pipeline.

59. (1) Foothills shall, from time to time, inspect, in a manner satisfactory to the designated officer, the implementation of the erosion control measures referred to in section 52, the rehabilitation measures referred to in section 54, the revegetation measures referred to in section 55 and the measures relating to noxious weeds referred to in paragraphs 58(b) and (c).

(2) Foothills shall, in carrying out the inspection pursuant to subsection (1), evaluate the effectiveness of the measures referred to in that subsection and, when requested by the designated officer, report to the designated officer in a manner satisfactory to him the results and evaluation of such inspection.

(3) Where, in the opinion of the designated officer, the measures referred to in subsection (1) are ineffective, Foothills shall implement such remedial measures as are satisfactory to the designated officer.

#### Water Quality

60. Foothills shall not leave significant quantities of deleterious substances, as defined in the Fisheries Act for the purposes of sections 31, 33, 33.1 and 33.2 of that Act, sediment, silt or wood chips resulting from the construction of the pipeline in any area where they are likely to enter into any waterbody.

61. (1) Foothills shall take such measures as are satisfactory to the designated officer to minimize the entry into any waterbody of any aqueous run-off or discharge resulting from the construction of the pipeline.



(2) Where there is any aqueous run-off or discharge referred to in subsection (1) and that run-off or discharge enters a waterbody, Foothills shall take such measures as are satisfactory to the designated officer to protect the quality of the water in the waterbody.

62. Where the construction or operation of the pipeline takes place within a waterbody, Foothills shall take such measures as are satisfactory to the designated officer to protect the quality of the water in that waterbody.

63. Foothills shall, when requested by the designated officer and at such intervals as are satisfactory to him, sample the water receiving aqueous run-off or discharge resulting from the construction or operation of the pipeline and analyze its quality by a method satisfactory to the designated officer.

#### Air Quality

64. Where Foothills submits to the designated officer for his approval proposals for the design and location of a compressor station for the pipeline, Foothills shall include in the submission a description of the measures Foothills intends to implement

- (a) to control air pollution and to disperse and, where possible, reduce any ice fog resulting from the operation of the pipeline; and
- (b) to preserve the aesthetic value of the landscape in the vicinity of the pipeline.

65. Foothills shall, in the operation of a compressor station, take such measures as are satisfactory to the designated officer to minimize any adverse effects of air pollution and ice fog resulting from the operation of the pipeline on

- (a) the health or recreation of any person;
- (b) transportation; or
- (c) wildlife and wildlife habitat.

66. (1) Foothills shall, at each compressor station selected by the designated officer,

- (a) sample and analyze air quality in the vicinity of that compressor station,

- (b) sample and analyze gaseous emissions from the compressor station, and
- (c) record the quantity and type of fuel consumed at that compressor station

by a method and at times approved by the designated officer.

(2) Foothills shall report to the designated officer, when requested by him, the results of the sampling and analysis and measurements referred to in paragraphs (1)(a) and (b) and the record of the quantity and type of fuel consumed referred to in paragraph (1)(c).

### Noise

67. Foothills shall incorporate noise abatement devices in the design of any compressor station it installs for the pipeline.

68. Foothills shall, in the construction and operation of the pipeline, take such noise abatement measures as are satisfactory to the designated officer to minimize the disturbance by noise of

- (a) persons residing in the vicinity of the pipeline;
- (b) wildlife referred to in section 70 whose continued existence is threatened in the areas of land and waterbodies set out in the list referred to in that section during the periods of time set out in the list in respect of such wildlife; and
- (c) livestock in the vicinity of the pipeline.

69. (1) Foothills shall, when requested by the designated officer and in a manner satisfactory to him, measure noise levels caused by the operation of pipeline facilities and equipment and shall report, within a reasonable period of time, the noise levels so measured to the designated officer.

(2) Where, in the opinion of the designated officer, any noise level reported to him pursuant to subsection (1) disturbs persons, wildlife or livestock referred to in section 68, Foothills shall take such remedial measures as are satisfactory to the designated officer.

### Wildlife

70. Foothills shall, when requested by the designated officer and following consultation with the government of the Province, submit to

him for his approval a list setting out those areas of land and waterbodies in which, and the periods of time in respect of those areas and waterbodies during which, the construction or operation of the pipeline may

- (a) threaten the continued existence of significant wildlife populations; or
- (b) result in significant adverse effects on significant wildlife populations.

71. Foothills shall, in a manner satisfactory to the designated officer, prepare construction schedules for the pipeline and propose the location of the pipeline in such a manner that when the construction of the pipeline is being carried out the adverse impact on wildlife in any areas and during any periods of time in respect of those areas set out in the list referred to in section 70 is minimized.

72. Foothills shall take such measures as are satisfactory to the designated officer to prevent big game animals from being obstructed or entrapped by the construction of the pipeline.

73. (1) Where requested by the designated officer, Foothills shall, during the construction and operation of the pipeline, monitor, at such locations and times and for such periods as are satisfactory to the designated officer, the impact resulting from the construction and operation of the pipeline on the habitat, seasonal distribution and movement of significant wildlife populations.

(2) Foothills shall, in carrying out the monitoring pursuant to subsection (1), evaluate the effectiveness of its measures to mitigate any adverse impact on significant wildlife populations and shall, when requested by the designated officer, report to him the results of such monitoring.

74. Where, in the opinion of the designated officer,

- (a) the proposed location of the pipeline or the construction schedule of the pipeline referred to in section 71 is such that it does not minimize the adverse environmental impact on wildlife, or
- (b) the measures taken pursuant to section 72 are ineffective

Foothills shall take such remedial measures as are satisfactory to the designated officer.

75. Foothills shall take such measures as are satisfactory to the designated officer to prevent the construction and operation of the pipeline from unreasonably interfering with hunting, guiding or trapping in the vicinity of the pipeline.

#### Fisheries

76. (1) Foothills shall, when requested by the designated officer and following consultation with the government of the Province, submit to him for his approval a list setting out those areas of fish habitat in which, and the periods of time in respect of those areas during which, the construction or operation of the pipeline may threaten the continued existence of significant fish populations.

(2) The areas referred to in subsection (1) shall include fish spawning and rearing grounds, overwintering areas and migration routes in the waterbodies through which the pipeline passes.

(3) The periods of time referred to in subsection (1) shall include those periods for the spawning, incubation, emergence and rearing and migration of the fish.

77. Where Foothills prepares construction schedules for the pipeline, Foothills shall prepare the schedules in such a manner that when the construction of the pipeline is carried out any adverse impact of the construction of the pipeline on the fish in any fish habitat and during the periods of time in respect of that habitat set out in the list referred to in subsection 76(1) is minimized to the satisfaction of the designated officer.

78. Where the pipeline or any facility is

- (a) scheduled to be constructed at a time, or
- (b) located at a place

that may be disruptive to significant fish populations, Foothills shall take such measures as are satisfactory to the designated officer to avoid or minimize, to the satisfaction of the designated officer, any adverse environmental effects on significant fish populations and fish habitat.

79. Foothills shall implement construction and operation practices to protect, to the satisfaction of the designated officer,

significant fish populations and fish habitat against any adverse effect of any siltation, excavation of granular materials, spills of fuel or toxic chemicals, changes in water temperature and chemistry or reduction in dissolved oxygen in the water in any waterbody through which the pipeline passes.

80. Foothills shall not, during the construction of the pipeline, unless permitted by the designated officer,

- (a) obstruct fish migration routes during any periods set out in the list referred to in subsection 76(1) by any blockage, diversion or prolonged acceleration of water flow; or
- (b) during such period, withdraw water from overwintering areas or from groundwater directly replenishing those areas.

81. Where Foothills places a culvert in a waterbody frequented by fish populations, Foothills shall take such measures as are satisfactory to the designated officer to allow the passage of fish populations through the culvert during any period set out in the list referred to in subsection 76(1).

82. Foothills shall take measures satisfactory to the designated officer to prevent the construction and operation of the pipeline from unreasonably interfering with any domestic, commercial or sport fishing or adversely affecting any fishing area in any area through which the pipeline passes.

83. (1) When requested by the designated officer, Foothills shall, in a manner satisfactory to him, monitor fish movements and fish habitat utilization during the construction of the pipeline.

(2) Foothills shall, in carrying out the monitoring referred to in subsection (1), evaluate the effectiveness of

- (a) the construction schedule referred to in section 77;
- (b) the measures referred to in sections 78, 81, and 82; and
- (c) the practices referred to in section 79.

and shall, when requested by the designated officer, report to the designated officer in a manner satisfactory to him the results of the evaluation and of the monitoring referred to in subsection (1).

84. Where, in the opinion of the designated officer, the measures or practices referred to in section 78, 79, 81 or 82 are ineffective, Foothills shall take such remedial measures as are satisfactory to the designated officer.

Special Interest Areas

85. (1) Foothills shall, in consultation with the government of the Province, identify each area of natural or cultural significance in the vicinity of the proposed route of the pipeline and shall propose a location of the pipeline that, insofar as possible, does not pass through that area.

(2) Where the location referred to in subsection (1) of the pipeline is in an area identified under that subsection and the location of the pipeline has been approved by the designated officer, Foothills shall take such measures as are satisfactory to the designated officer to protect the natural and cultural values of that area.

86. Foothills shall take such measures as are satisfactory to the designated officer to minimize the adverse impact of the construction of the pipeline within 2 km of the limits of any park, wildlife or game sanctuary, ecological reserve, International Biological Program site, historical or archaeological site or research, conservation or recreation site proposed or established under any law of Canada or of the Province.

87. Foothills shall obtain the approval of the designated officer before commencing the construction of any portion of the pipeline within 30 m of a monument, archaeological site or burial ground.

88. Foothills shall establish and conduct an archaeological program satisfactory to the designated officer to

- (a) identify, investigate and protect or excavate archaeological sites; and
- (b) analyze archaeological and associated palaeoecological materials

on land used for or disturbed by the construction of the pipeline.

89. Foothills shall, at any time at the request of the designated officer and at the termination of the archaeological program referred to in section 88, submit to the designated officer a report satisfactory to the designated officer of the results of that program.

90. Foothills shall provide, when requested by the designated officer, evidence satisfactory to the designated officer that any arch-

aeological and related materials, field notes, plans and maps, photographs, analyses and other relevant documents collected during the archaeological program referred to in section 88 are retained at a place and under such arrangements as are approved by the government of the Province.

91. Foothills shall immediately report any discovery of a historical or archaeological site to the designated officer and shall not disturb the site without his prior approval.

92. (1) In constructing the pipeline, Foothills shall avoid, where practicable, disturbance of geodetic or legal survey monuments.

(2) Where a geodetic monument is disturbed in the course of the construction of the pipeline, Foothills shall report such disturbance forthwith to the designated officer.

(3) Where a geodetic monument is disturbed, Foothills shall, at its expense and in accordance with the instructions of the Dominion Geodesist, cause the monument to be restored or re-established.

#### Agricultural Land

93. Foothills shall, when constructing the pipeline on land comprising part of an agricultural land reserve or grazing reserve, take into account the provisions set out in the document entitled "Terms and Conditions for Linear Development in Agricultural Land Reserves and Grazing Reserves" issued by the Ministry of Agriculture of the government of the Province.

94. Where topsoil on agricultural land is disturbed or removed during construction of the pipeline, Foothills shall take such measures as are satisfactory to the landowner or tenant as soon as possible after the disturbance or removal to stabilize the surface or replace such topsoil of such agricultural land and to return it, as far as is practicable, to its previous level of productivity.

95. Where, as a consequence of the construction of the pipeline, a fence or gate is damaged or destroyed by Foothills, Foothills shall, in consultation with the owner of the land on which the fence or gate is situated or the tenant thereof, repair or replace that fence or gate.

96. Where Foothills requires access to the pipeline for the purpose of maintenance through land that is fenced, Foothills shall, in consultation with the landowner or tenant, construct and maintain a gate in the fence for such access.

97. Where Foothills has stabilized the surface of agricultural land and returned it as far as is practicable to its previous level of productivity pursuant to section 94, Foothills shall

- (a) inspect to the satisfaction of the landowner or tenant agricultural land that may have been or may be affected by the pipeline;
- (b) report, within a reasonable period of time, to the designated officer any evidence of any adverse environmental impact on agricultural land; and
- (c) take such remedial measures as directed by the designated officer in respect of any agricultural land discovered by the inspection to be affected by the pipeline.

#### Clearing

98. Foothills shall minimize to the satisfaction of the designated officer any adverse environmental impact of vegetation clearing operations by Foothills including such impact on erosion-sensitive terrain.

99. Foothills shall, in respect of the construction of the pipeline,

- (a) clear vegetation from only those areas essential for the construction;
- (b) cut, stack and dispose of any merchantable timber cleared by Foothills in such manner as is satisfactory to the designated officer;
- (c) leave a buffer strip of undisturbed vegetation satisfactory to the designated officer

- (i) between any area cleared by Foothills of vegetation and an adjacent waterbody, and
- (ii) between any area cleared of vegetation and an adjacent road;

(d) promptly remove any debris entering or likely to enter any waterbody as a result of the clearing of vegetation by Foothills; and



(e) take measures satisfactory to the designated officer to minimize windthrow in buffer strips.

100. (1) Foothills shall, when clearing any area for construction, take measures to minimize to the satisfaction of the designated officer the operation of any machinery along or across any permanent or intermittent river or stream channel.

(2) Foothills shall not skid any logs along or across any unfrozen permanent river or stream channel or along any unfrozen intermittent stream channel.

101. Foothills shall dispose of any debris resulting from the clearing of vegetation by Foothills in such manner as is satisfactory to the designated officer.

102. Foothills shall not pile any debris resulting from the construction of the pipeline in a manner that creates a continuous barrier to big game animal movements.

#### Fuel and Other Hazardous Material

103. Foothills shall

(a) establish procedures satisfactory to the designated officer to minimize the possibility of an accident occurring during the storage, handling and use of fuel or any other hazardous material;

(b) locate, in a manner satisfactory to the designated officer, storage and handling sites for fuel and hazardous material to minimize any contamination of any waterbody set out in the list referred to in section 70, any fish habitat set out in the list referred to in subsection 76(1) or any important fish harvesting area; and

(c) establish procedures satisfactory to the designated officer to contain and clean up any fuel or other hazardous material spilled, misused or allowed to escape.

104. Foothills shall not, in constructing the pipeline,

(a) use bladder tanks to store fuel; or

(b) store fuel within 300 m of a waterbody unless it has obtained the approval of the designated officer.

105. (1) Where Foothills uses a fuel storage area containing any above-ground tank exceeding 5000 l in capacity, Foothills shall surround that area by a dyke of reinforced concrete or a dyke of earth lined with plastic or other impervious material.

(2) Foothills shall, in constructing a dyke referred to in subsection (1), comply with any requirements established by the designated officer for the design and location of the dyke and of the area that it surrounds.

106. (1) Where Foothills stores more than 5000 l of fuel in storage facilities at any place, it shall

- (a) establish procedures satisfactory to the designated officer to detect any loss of fuel from such storage facilities; and
- (b) record all fuel transfers to and from such facilities.

(2) Where Foothills determines that a loss of fuel has occurred from a storage facility referred to in subsection (1), it shall investigate the cause of such loss and take such measures as are satisfactory to the designated officer to prevent further loss.

107. (1) Foothills shall establish procedures satisfactory to the designated officer to detect any loss of hazardous material at any storage or handling facility used by Foothills.

(2) Where there is any loss of hazardous material referred to in subsection (1), Foothills shall investigate the cause of the loss and take such measures as are satisfactory to the designated officer to prevent further loss.

108. Foothills shall not

- (a) use, transport or dispose of any radioactive materials, or
- (b) use herbicides or pesticides except for domestic use

unless such use, transportation or disposition, as the case may be, is approved by the designated officer.

#### Waste Management

109. (1) Foothills shall collect any liquid or solid wastes produced as a consequence of the construction, operation or

abandonment of the pipeline and, where required by the designated officer, treat them in a manner satisfactory to the designated officer.

(2) Foothills shall dispose of the liquid or solid wastes referred to in subsection (1) in a manner satisfactory to the designated officer.

110. Foothills shall not use

(a) a natural waterbody, swamp, marsh, bog or fen as a lagoon for the containment of any liquid or solid wastes referred to in subsection 109(1); or

(b) borrow pits as liquid or solid waste disposal sites unless such use is approved by the designated officer.

111. Foothills shall submit to the designated officer for approval any proposed location for a liquid waste lagoon or solid waste disposal site for use by Foothills during the construction of the pipeline.

112. Foothills shall minimize to the satisfaction of the designated officer any contamination of any waterbody or groundwater by waste from solid waste disposal sites.

113. Foothills shall establish procedures satisfactory to the designated officer for the handling and disposal of any waste containing a hazardous material.

114. (1) Foothills shall meet any standards of composition as may be specified by the designated officer for the effluent from a liquid waste treatment system used by Foothills.

(2) Foothills shall discharge the effluent referred to in subsection (1) at times and under such conditions as are satisfactory to the designated officer.

115. Foothills shall establish procedures satisfactory to the designated officer to prevent access by carnivorous mammals and bears to waste disposal sites, incinerator sites or other waste storage or treatment sites and to minimize the attractiveness of such sites to such mammals and bears.

116. Foothills shall dispose of waste soil, rock, stumps, vegetation and other materials resulting from pipeline construction in such a manner as is satisfactory to the designated officer.

117. (1) Foothills shall, in such a manner as is satisfactory to the designated officer,

- (a) monitor the operation of its liquid waste treatment facilities and the quantity and composition of effluent discharges therefrom, and
- (b) monitor the effectiveness of its solid waste management procedures

at such times as directed by the designated officer.

(2) Foothills shall forthwith report the results of the monitoring referred to in subsection (1) to the designated officer.

(3) Foothills shall take such remedial measures as directed by the designated officer in respect of solid waste management and liquid waste treatment.

#### Granular Materials, Borrow Pits and Quarries

118. Where Foothills uses a borrow pit or quarry, Foothills shall minimize to the satisfaction of the designated officer

- (a) the disturbance of the environment in the vicinity of the borrow pit or quarry;
- (b) the amount of land used for the borrow pit or quarry; and
- (c) the amount of materials extracted from the borrow pit or quarry.

119. Foothills shall, where possible, use existing roads, trails or cutlines for access to borrow pits or quarries.

120. Foothills shall leave buffer strips of undisturbed vegetation between any borrow pit or quarry that it opens and any adjacent road.

121. (1) Foothills shall not, without the approval of the designated officer, use a borrow pit or quarry adjacent to or within a waterbody, swamp, marsh, bog or fen.

(2) Where the use of a borrow pit or quarry referred to in subsection (1) has been approved by the designated officer, Foothills shall take such measures as are satisfactory to the designated officer to minimize siltation in that waterbody, swamp, marsh, bog or fen, as the case may be.

122. (1) When directed by the designated officer, Foothills shall close and rehabilitate, in a manner satisfactory to the designated officer, any borrow pit or quarry that it uses.

(2) Where Foothills is required to rehabilitate a borrow pit or quarry pursuant to subsection (1), it shall, to the satisfaction of the designated officer,

- (a) stabilize the ground surface; and
- (b) re-establish vegetation on such ground surface.

123. Where Foothills uses any granular materials for the construction of the pipeline, it shall use such granular materials in a manner satisfactory to the designated officer and compatible with any other use of such materials by persons residing in that portion of the Province through which the pipeline passes.

### Blasting

124. Foothills shall establish blasting procedures satisfactory to the designated officer to minimize

- (a) any adverse effects on bird, fish or mammal populations, and
- (b) any interference with fishing, hunting, guiding or trapping

in the area through which the pipeline passes.

125. Foothills shall not blast within 20 m of any waterbody, swamp or marsh without the approval of the designated officer.

126. Where Foothills intends to blast, it shall advise persons living in the vicinity of its intention and of the time of the intended blasting.

Water Crossings

127. Foothills shall, when requested by the designated officer, submit to him site-specific data satisfactory to him on the hydrological or geotechnical conditions at any place where the pipeline crosses any waterbody.

128. (1) Foothills shall

- (a) inspect every pipeline water crossing for evidence of deterioration in bank stability and stream bed condition, and
- (b) when directed by the designated officer, monitor the consequences of any pipeline water crossing

in such manner as is satisfactory to the designated officer.

(2) Foothills shall report to the designated officer, within a reasonable period of time, the results of the inspection referred to in paragraph (1)(a) and, when required by the designated officer, the results of the monitoring referred to in paragraph (1)(b).

129. Where the designated officer is of the opinion that remedial measures are necessary at a pipeline water crossing, Foothills shall take such remedial measures as are satisfactory to the designated officer.

130. Foothills shall,

- (a) in respect of every waterbody referred to in the list required to be submitted pursuant to section 70 in respect of the threatened existence of wildlife, and
- (b) in respect of every waterbody containing a fish habitat area referred to in the list required to be submitted pursuant to subsection 76(1),

in which groundwater contributes significantly to winterflow in or under the bed of that waterbody, take such measures as are satisfactory to the designated officer to maintain adequate winter groundwater and channel flow in such waterbody.

131. When constructing the pipeline across a stream, Foothills shall trench, lay pipe and backfill the banks of the stream as expeditiously as possible.

132. Where the natural action of a stream will not restore the bed of such stream to its original shape and extent after the completion of construction, Foothills shall, unless otherwise directed by the designated officer, take measures to restore the stream to its original shape and extent by using the original material of the stream bed or other material of equivalent stability.

#### Water Withdrawal, Water Discharge and Hydrostatic Testing

133. Where Foothills withdraws water from or discharges water into a waterbody, it shall withdraw or discharge the water in a manner satisfactory to the designated officer and in a manner that will not have an unreasonably adverse effect on

- (a) the level or rate of flow of water in the waterbody or well from which the water withdrawal is made or into which the discharge is made;
- (b) the existing use of the waterbody from which the water withdrawal is made or into which the discharge is made;
- (c) the transportation on or access to the waterbody from which the water withdrawal is made or into which the discharge is made;
- (d) the trapping or fishing by persons residing in the vicinity of the pipeline;
- (e) the fish populations in or dependent on the waterbody from which the water withdrawal is made or into which the discharge is made; and
- (f) any waterfowl or mammal populations using any waterbody or its margins from which the water withdrawal is made or into which the discharge is made.

134. (1) Subject to subsection (2), Foothills shall not allow, during any withdrawal of water from a waterbody for hydrostatic testing, the rate of flow or depth of water in that waterbody to fall below such minimum as is specified by the designated officer.

(2) Foothills may withdraw water referred to in subsection (1) where the rate of flow and depth of water in the waterbody is below the minimum specified pursuant to that subsection if such withdrawal is approved by the designated officer.

135. Foothills shall, when designing or operating a camp water system, compressor station water system, granular material washing system or any other water related system, design or operate, as the case may be, that system in a manner that will minimize the use of water.

136. Foothills shall, when carrying out hydrostatic testing of the pipeline, carry out such tests in a manner that will minimize the use of water.

137. Foothills shall appoint a qualified person to supervise the withdrawal and discharge of water for the construction or testing of the pipeline.

138. Where Foothills withdraws water for the construction or testing of the pipeline, it shall install screens satisfactory to the designated officer on all water intakes.

139. Foothills shall, in a manner satisfactory to the designated officer, furnish him with the details in respect of each water withdrawal or discharge used for testing the pipeline.

140. Foothills shall take such measures as are satisfactory to the designated officer

- (a) to avoid spilling any test fluid other than as a result of the failure of the pipe when being tested; and
- (b) to clean up the effect of any hydrostatic fluid that has been spilled.

141. Foothills shall not discharge any hydrostatic test fluid unless the fluid meets such standards of composition for such test fluid as are satisfactory to the designated officer.

142. Foothills shall conduct all hydrostatic tests of the pipeline in the presence of the designated officer or his authorized representative.

#### Roads and Other Facilities

143. Where Foothills is required to submit to the designated officer for approval the design and location of any permanent access road or pipeline facility, other than a road or facility on the pipeline right-of-way, and the procedures to be used in the constructing, operating or abandonment of the road or facility, Foothills shall take



into account the local and regional environment including the following:

- (a) hydrological characteristics;
- (b) terrain conditions;
- (c) ground thermal regime;
- (d) wildlife and fish populations;
- (e) land and water use for purposes other than for the pipeline;
- (f) archaeological sites; and
- (g) aesthetic value of the landscape and waterbodies.

144. Foothills shall maintain every road surface in such a manner that cross drainage is both efficient and effective without causing accelerated erosion or ponding.

145. Unless otherwise directed by the designated officer, Foothills shall install a bridge or culvert at every place where a road crosses a permanent or intermittent river or stream.

146. Foothills shall, where required by the designated officer, render any access road built or rehabilitated by it, other than a road to be used by Foothills in the maintenance of the pipeline, impassable and take such measures as are satisfactory to the designated officer to control erosion of such road.

147. Foothills shall not construct or use a bridge over a waterbody that consists of logs on top of which earth has been placed.

148. Where Foothills builds any snow access road, it shall,

- (a) locate such road in a manner that minimizes disturbance to vegetation; and
- (b) breach such road, where necessary, in preparation for spring run-off.

149. (1) Where Foothills builds any ice bridge it shall locate such ice bridge in a manner that minimizes approach grades and cuts in the river or stream over which the bridge is built.

(2) Foothills shall not use debris or fill in the construction of an ice bridge referred to in subsection (1).

Machinery, Transportation and Construction Equipment

150. Foothills shall take such measures as are satisfactory to the designated officer to minimize the use by Foothills of machinery, transportation and construction equipment in any area other than public and access roads and the pipeline right-of-way.

151. Where Foothills operates machinery, transportation or construction equipment within any waterbody, such operation shall take place during such time and in such manner as is satisfactory to the designated officer.

152. Foothills shall equip and maintain all machinery and transportation and construction equipment with factory standard emission and noise control devices.

Inspection and Monitoring

153. (1) Foothills shall, in a manner satisfactory to the designated officer, inspect the pipeline and the land and water disturbed by the pipeline, evaluate the results of the inspection and, when directed by the designated officer, monitor the environmental impact of the pipeline.

(2) When requested by the designated officer, Foothills shall, within a reasonable period of time, report the results of the inspection, evaluation and monitoring referred to in subsection (1) to the designated officer.

154. Where the designated officer is of the opinion that the construction or operation of the pipeline has caused or is likely to cause a significant adverse environmental impact, Foothills shall take such measures as are satisfactory to the designated officer to mitigate or remedy the environmental impact and to prevent its recurrence.

Submission and Implementation of Environmental Plans

155. (1) Foothills shall submit to the designated officer for approval one or more plans or manuals that set out the procedures and measures by which Foothills intends to

- (a) comply with this Part;
- (b) carry out any environmental requirements imposed by law; and
- (c) carry out the protection of the environment other than by measures required by this Part.

(2) Foothills shall, by such date as may be fixed by the designated officer, submit to the designated officer a plan schedule for his approval that sets out the date each plan or manual referred to in subsection (1) is to be submitted to the designated officer.

(3) The plan schedule referred to in subsection (2), when approved by the designated officer, constitutes Foothills' plan schedule and Foothills shall comply therewith.

156. Where the designated officer approves a procedure or measure set out in a plan or manual submitted by Foothills pursuant to subsection 155(1), Foothills shall thereupon carry out such procedure or measure.

157. Where, subsequent to the approval by the designated officer of any of the measures or procedures referred to in subsection 155(1), Foothills obtains any additional information of environmental significance relating thereto, Foothills shall forthwith report such information to the designated officer.

158. (1) Foothills shall submit to the designated officer, in accordance with a schedule approved by him,

- (a) the environmental information used by it in preparing the plans or manuals referred to in subsection 155(1);
- (b) construction scheduling and engineering design information necessary for a review and evaluation of the plans or manuals referred to in subsection 155(1);
- (c) environmental information necessary to evaluate potential environmental impacts; and
- (d) information in respect of the environment in the vicinity of the pipeline prior to the commencement of the construction of the pipeline necessary to measure any environmental impact.

(2) When requested by the designated officer Foothills shall submit to him

- (a) information in respect of those areas where thaw settlement may require measures to be taken to comply with section 49; and

(b) any studies, reports, analyses or other material on which the information submitted pursuant to sections 70 and 76 are based.

(3) Where Foothills conducts studies or gathers data or information when considering the effect, if any, of the construction or operation of the pipeline on the existing or potential use of any land or waterbody through which the pipeline passes for the purpose of taking into account such effect pursuant to section 48, such studies, data or information shall be submitted by Foothills to the designated officer when requested by him.

159. When requested by the designated officer and in a manner satisfactory to him, Foothills shall submit to him,

(a) environmental and other information necessary for the determination of the pipeline location; and

(b) any procedures or measures proposed by Foothills as alternatives to the procedures or measures referred to in subsection 155(1).

## ENVIRONMENTAL GUIDELINES

ENVIRONMENTAL GUIDELINES FOR THE  
CONSTRUCTION OF THE SWIFT RIVER SEGMENT  
OF THE NORTHERN PIPELINE IN BRITISH COLUMBIA

Terrain, Landscape and Waterbodies

1. In designing, proposing routes and alignments for, and constructing the pipeline, Foothills should take measures to protect the aesthetic values of landscapes and waterbodies. In particular Foothills should construct the pipeline so that the state of the area affected is, in so far as possible, the same after construction as before.

2. Foothills should plan, schedule and implement maintenance and repair activities so as to minimize adverse impacts on landscape and waterbodies, and, in particular, on the integrity of permafrost and other sensitive terrain.

3. Foothills should afford swamps, marshes, bogs and fens the same level of protection as waterbodies, taking into account their hydrological importance and their importance as wildlife habitat.

4. In complying with term and condition 47 Foothills should take measures to protect waterbodies and their surroundings from disturbance. In particular Foothills should:

(a) design and carry out works which encroach upon waterbodies, such as pipeline crossings, road crossings and water intakes, so as to minimize changes in water quality, flow or level, or morphology of the channel or bank;

(b) carry out construction on and near river banks, in valleys, and on valley walls so as to minimize disturbance of the ground surface and maintain as much of the natural vegetation as possible; and

(c) where disturbances referred to in guideline 4(b) do occur, promptly stabilize the ground surface and prevent entry of silt-laden runoff into waterbodies.

5. Foothills should leave buffer strips of undisturbed vegetation as follows:

Between a waterbody and:	Minimum Width (Metres)
road (except where crossing)	100
borrow pit	100
pipeline right-of-way (except where crossing)	100
construction camp	300
stockpile site	300
Between a public road and:	
borrow pit	100
compressor station	100

and should avoid disturbance within such buffer strips except when taking measures to prevent windthrow.

6. When planning and constructing the pipeline, Foothills should maintain separation distances as follows:

Between a waterbody and:	Minimum Separation (Metres)
sewage lagoon	100
fuel or hazardous material storage site	300
solid waste disposal site	300
cleared area	100
burning site	100
spoil pile	100
oil change area	100

7. In complying with term and condition 48 Foothills should assess the sensitivity of terrain to be traversed by alternative routes and alignments of the pipeline and the extent to which disturbance of such terrain could adversely affect waterbodies and wildlife habitat.

8. In complying with term and condition 48 Foothills should take into account:

(a) the cumulative environmental impact of the construction, operation and abandonment of the pipeline; and

(b) possible interactions between environmental impacts of the pipeline and those of other developments expected to occur in the near future in the region.

9. Foothills should provide terrain and landscape protection in specific problem areas by assessing, through test drilling and/or other means, potential problem areas such as ice-rich silts, organic bogs, and surface erosion and slope instabilities at river crossings and on other sensitive terrain.

#### Permafrost and Frozen Ground

10. In complying with term and condition 49 Foothills should take into account:

- (a) ground surface degradation (thermokarst);
- (b) slope failure;
- (c) ponding or other drainage changes; and
- (d) changes in groundwater movement including flow through river-bed materials.

11. In order to reduce or avoid adverse environmental impacts relating to permafrost and frozen ground Foothills should:

- (a) in developing site-specific designs, acquire adequate geotechnical and hydrological data, including information about groundwater, and carry out slope stability analyses;
- (b) allow for site-specific design adjustments in response to unexpected terrain conditions actually encountered during construction;
- (c) allow for local site or alignment adjustments to avoid, to the extent practicable, geotechnical materials sensitive to thawing or freezing, particularly on sloping terrain;
- (d) minimize the disturbance of the ground surface and, in particular, of any insulating mat of vegetation and organic materials;
- (e) use thaw-stable materials as backfill; and
- (f) stabilize and rehabilitate disturbed sensitive permafrost terrain as soon as practicable and, if necessary, insulate the subsurface.



12. When necessary, Foothills should conduct field studies to resolve environmental problems related to thaw settlement.

#### Drainage, Erosion Control and Revegetation

13. On permafrost terrain, Foothills should, as soon as practicable, rehabilitate and stabilize organic mats, vegetation and soils that have been disturbed.

14. On permafrost terrain where the soil is fine-grained and/or of a high ice content, Foothills should implement revegetation and erosion control measures as quickly as possible after disturbance so as to forestall thermal degradation, slope failure and ground subsidence.

15. Foothills should design and maintain all drainage ways and control structures to accommodate changes in ground level that might be caused by thawing of the ground or surface subsidence along the right-of-way and should take into account potential disruption of drainage ways arising from the growth of stream icings and surface icings.

16. Foothills should locate sediment traps and other devices so as to ensure that sediments, particularly silt particles, in water flowing from the right-of-way or from facilities do not adversely affect the surrounding terrain or waterbodies. In particular, Foothills should control erosion on the banks of rivers and streams, valley slopes, and cut slopes along the right-of-way.

17. Foothills should maintain or remove as appropriate drainage and erosion control devices at all sites that are no longer in use. Such sites include temporary roads, borrow sites, spoil disposal sites, stockpile sites, and work pads.

18. Foothills should identify unstable and potentially unstable slopes and develop and implement a program satisfactory to the designated officer for the inspection and, where required by the designated officer, monitoring of slope stability during construction and operation.

19. Foothills should take measures to prevent the pipeline from causing the ponding of water, the unintentional channelization of overland flow, or erosion arising from either of the preceding phenomena.

20. Foothills should provide surface drainage of adequate capacity across the pipeline right-of-way including any backfill mound and across roads, airstrips, and other facilities.

21. Where revegetation is not possible or would be ineffective in stabilizing the surface, Foothills should leave disturbed areas in a stabilized condition by measures which may include placement of mat binders, soil binders, rock or gravel blankets or other structures.

22. In complying with term and condition 57 Foothills should give priority to areas that are most susceptible to erosion.

23. Where scheduling of revegetation activities might result in disturbance to wildlife, Foothills should take measures to minimize such disturbance.

24. In complying with term and condition 59 Foothills should observe and record the impact of its erosion control, rehabilitation and revegetation measures on:

- (a) stream banks and beds; and
- (b) changes in water levels and velocities.

25. Foothills should periodically inspect all its culvert installations and take appropriate action prior to and during the spring snow-melt period to clear culverts blocked by ice or debris.

#### Water Quality

26. Where the construction or operation of the pipeline causes effluent to be released into a waterbody, or otherwise results in changes in a waterbody, Foothills should maintain the following standards of water quality in such waterbodies, except where natural predisturbance levels do not meet these standards:

- (a) maximum reduction of dissolved oxygen not to exceed 10% of natural concentration; minimum concentration of dissolved oxygen in a waterbody as a result of reduction not to be less than 6 mg/l;

(b) pH to be within 0.5 of that immediately upstream of the discharge or release;

(c) water temperature to be within 2°C of that immediately upstream of the discharge or release;

(d) phenols not to exceed 0.2 mg/l in waters not used for domestic purposes and 0.005 mg/l where discharge is into water used for domestic purposes;

(e) toxic substances not to exceed concentrations recommended in WATER QUALITY CRITERIA, 1972 (U.S. National Academy of Sciences and the National Academy of Engineering);

(f) levels of total nitrogen and phosphorous may be specified for specific locations to avoid eutrophication; and

(g) chemical content to meet British Columbia Pollution Control Objectives.

27. (1) In complying with term and condition 63, where water quality is likely to be adversely affected by construction of the pipeline Foothills should monitor suspended sediment concentrations in waterbodies listed pursuant to terms and conditions 70 and 76.

(2) In determining the frequency and location of samples when carrying out the monitoring referred to in subsection (1), Foothills should:

(a) determine the nature and period of the anticipated impact on water quality; and

(b) locate control sites in unaffected parts of the same waterbody, or in similar nearby waterbodies.

28. Foothills should adopt analytical procedures in accordance with the LABORATORY MANUAL FOR THE CHEMICAL ANALYSIS OF WATERS, WASTE-WATERS, SEDIMENT AND BIOLOGICAL MATERIALS, Province of B.C.

29. Foothills should collect all water quality data in a form so that it can be incorporated into the Provincial Water Quality Data Bank (EQUIS).

### Air Quality

30. Foothills should control emissions to ambient air from pipeline facilities and solid waste incinerators so that concentrations of pollutants do not exceed "maximum desirable levels" defined in the Pollution Control Objectives of British Columbia.

31. Foothills should locate, to the extent possible, all pipeline facilities that might produce ice fog so as to minimize interference with transportation, communities and the operation of air fields.

### Noise

32. In complying with term and condition 67 Foothills should design for noise levels of less than 50 dBA (Leq 24) at 400 m from compressor stations.

33. Foothills should locate compressor stations at least 1km from areas identified pursuant to term and condition 70 and from areas used extensively by local people. Foothills should take additional measures to control noise emitted by compressor stations and adopt operating practices to reduce noise.

34. Foothills should, insofar as is practicable, schedule intermittent noise producing events such as those created by aircraft, so that they do not disrupt wildlife during periods referred to in term and condition 70.

35. Foothills should locate airfields and helipads at least 5 km from areas identified pursuant to term and condition 70 unless a lesser distance can be clearly justified.

36. Foothills should locate airfield runways so that landing and takeoff pathways avoid overflight of areas identified pursuant to term and condition 70.

37. Foothills should maintain noise suppression equipment on all construction machinery and vehicles in good order.

38. Foothills should monitor noise levels at each compressor station during normal operating conditions within six months and after eighteen months of the compressor station commencing operation.

### Wildlife

39. In drawing up the list referred to in term and condition 70 Foothills should include: denning areas; lambing or calving areas; nesting areas; winter ranges; mineral licks; escape terrain; and staging areas and migration routes including:

(a) Thinhorn Sheep

- (i) the winter range during the period October 15 to April 30;
- (ii) the area within 2 km of lambing areas during the period May 1 to June 15; and
- (iii) the area within 2 km of mineral licks during the period May 1 to August 31;

(b) Woodland Caribou

- (i) the area within migration routes during the periods September 15 to January 31 and April 15 to May 20 (these periods are based on preliminary research and may be refined when more data becomes available);
- (ii) the winter range from December 1 and March 31; and
- (iii) calving areas between May 1 and June 15;

(c) Raptors

- (i) the area within a 2 km radius of nesting sites of: peregrine falcons from April 15 to August 31; gyrfalcons from February 1 to August 31; and ospreys, golden eagles and bald eagles from March 1 to August 31;

(d) Waterfowl

- (i) the area within 1 km of lands or waters used for staging from April 1 to June 15 and August 15 to October 15; and
- (ii) the area within 1 km of nesting and moulting grounds from May 15 to August 31.

40. In drawing up the list referred to in term and condition 70, Foothills should take into account stoneweep, moose, wapiti, mule deer, wolf, fox, grizzly and black bear, fur-bearers, raptors, waterfowl and grouse in addition to those species and classes outlined in guideline 39. The list should include but not be limited to the following:

- (a) Moose winter range between January 1 and March 31;
- (b) Elk and mule deer winter range between November 1 and March 31;
- (c) Canid denning areas between March 31 and August 31;
- (d) Bear denning areas between October 15 and March 15; and
- (e) Sharp-tailed grouse lekking areas, April 1 to May 31.

41. In order to reduce or avoid impact on wildlife from low flying aircraft and helicopters during pipeline construction and operation, Foothills should cooperate with the Government of Canada in:

- (a) establishing flight corridors, and
- (b) establishing minimum flight altitudes within these corridors to avoid as far as practicable the areas and periods identified pursuant to term and condition 70.

42. Foothills should control the movement of its vehicular traffic on the right-of-way and on access roads to the right-of-way to reduce harassment of and collisions with big game animals.

43. In complying with term and condition 96, Foothills should consider as potential obstructions to big game animals:

- (a) open trenching;
- (b) strung pipe; and
- (c) snow fencing.

#### Fisheries

44. Foothills should ensure fish passage during construction in streams and waterbodies affected by such construction.

45. In consultation with the B.C. Fish and Wildlife Branch, Foothills should construct new channels which provide suitable habitat for fish where loss of, or severe damage to, existing channels containing water frequented by fish is unavoidable.

46. Foothills should remove as soon as practicable any debris resulting from clearing operations which might hinder fish passage.

47. Foothills should inform the regional office of the Water Management Branch, Province of B.C., five working days prior to the commencement of construction within the wetted perimeter of a waterbody.

48. Foothills should not remove gravel from the wetted perimeter of waterbodies frequented by important species of fish and within the wetted perimeter of tributaries upstream of such waterbodies except where a gravel removal order has been obtained.

49. Foothills should develop and implement monitoring programs to facilitate the protection of fish and aquatic habitat listed pursuant to term and condition 76. Foothills should include in the programs the collection of baseline data prior to construction and should design these programs to:

- (a) measure concentrations of dissolved oxygen, particularly in winter months, in waters that may undergo significant adverse environmental impact during construction;

- (b) measure water quality in locations where pipeline related activities may create water quality conditions detrimental to fish and where mitigating measures might be taken;

- (c) establish whether erosion control measures are working and whether areas disturbed during construction have been returned to a stable condition;

- (d) observe and record low water levels and flows to facilitate maintenance of adequate quantities of water for fish; and

- (e) measure water velocities at culverts and diversion structures to determine whether there are impediments to fish passage.

50. Foothills should minimize the amount of blasting within 300 m of a waterbody and, when blasting, take mitigative measures to protect fish and aquatic animals.

#### Special Interest Areas

51. Foothills should conduct a survey of the right-of-way and all other areas on which construction will take place following clearing

of vegetation but prior to commencement of excavation in order to identify areas of archaeological significance.

52. In those areas identified pursuant to guideline 51, Foothills should take measures, including test excavations, to identify those areas which require further excavation.

53. During construction in areas of high probability of archaeological discovery, Foothills shall inspect all excavations for sites of archaeological significance.

54. Foothills should arrange for emergency archaeological excavation of sites endangered by construction of the pipeline wherever such sites warrant attention and can be excavated without interfering with Foothills' construction schedule.

55. When for practical reasons, the sites referred to in guideline 54 cannot be investigated, Foothills should map and suitably flag these sites for later investigation.

#### Agricultural Land

56. On agricultural land Foothills should separate topsoil from subsoil during excavation and replace and stabilize both in a manner suited to the local situation.

57. Foothills should keep closed, except during passage of men and equipment, any gate constructed in compliance with term and condition 96.

58. Foothills should take measures to ensure that wildlife, landowners and livestock are able to cross open trenches. Such measures should include, but not necessarily be limited to:

- (a) restricting the length of open trenches;
- (b) limiting the period trenches are left open; and
- (c) constructing temporary bridges or backfilled areas.



59. Foothills should reseed land leased for grazing with species of forage plants suited to the local situation.

60. In order to control the spread of Perennial Sowthistle, Canada Thistle, Scentless Camomile and other noxious weeds, Foothills should:

(a) use seed mixes recommended by the B.C. Department of Agriculture;

(b) take measures to clean construction equipment brought in from other areas; and

(c) take measures to eradicate infestations of noxious weeds caused by construction of the pipeline.

#### Clearing

61. Prior to clearing an area, Foothills should identify and mark the boundaries of the area to be cleared.

62. On sensitive terrain, Foothills should use hand clearing techniques.

63. In areas where grading is not necessary, Foothills should use bladeshoe or appropriate blading techniques for clearing in order to minimize disturbance of the ground surface.

64. Foothills should minimize the period between the initiation of disturbance by clearing and the implementation of erosion control procedures.

65. Except where required for the movement of men and equipment, Foothills should not clear vegetation from river and stream banks, valley walls or sensitive slopes until just prior to construction.

66. Foothills should burn or otherwise dispose of all trees, snags, brush and other non-salvageable woody materials resulting from clearing. On winter trails and survey lines, trees may be lopped and scattered.

67. Foothills should conduct burning in small compact piles during approved periods.

68. Foothills should use burning racks or sleds when burning in ice-rich permafrost areas to prevent terrain subsidence.

69. Foothills should locate burning sites and disposal sites for excess cleared material within the perimeter of the cleared areas and, where practicable, at least 100 m from waterbodies. Foothills should consider chipping as an alternative in some instances.

70. Foothills should clear a sufficient area at water crossings to allow deposition of spoil material in such cleared areas.

#### Fuel and Other Hazardous Material

71. Fuel storage facilities should be constructed in accordance with the B.C. Fire Services Act and the National Fire Code.

72. Foothills should ensure that where fuel storage areas are located on permafrost terrain, the fuel storage areas are designed and constructed so that significant settlement or movement of the terrain does not occur.

73. Foothills should separate waste lubricating oils containing triester phosphates from other waste oils and treat with extra care.

74. Foothills should prepare a manual of procedures for handling hazardous material.

75. Foothills should minimize as far as practicable the use and storage time of non-fuel hazardous material during construction and operation.

76. Where more than one hazardous material is suitable for a job, Foothills should use the least hazardous of the alternatives.

77. Foothills should store stockpiles of toxic water soluble chemicals inside buildings or elevate them from the ground surface and cover with a waterproof sheet.

78. Foothills should not use PCB's or substances containing PCB's.

79. Foothills should use pesticides, herbicides and other similar chemicals which are of a non-persistent and, where possible, immobile nature.

80. Foothills should store hazardous material separately from other materials in clearly marked containers.

81. Foothills should maintain a record of the location of spill control equipment.

82. Foothills should inspect and maintain spill control equipment on a regular basis.

83. Foothills should install automatic shut-off nozzles on all hoses and other equipment used to transfer hazardous material.

84. Foothills should label equipment to be used for handling highly dangerous materials such as radioactive wastes and complex organic chemicals. Such equipment should be decontaminated prior to removal from storage sites.

85. Foothills should use hazardous material in a manner so as to minimize the production of hazardous waste residues.

86. Foothills should station equipment necessary to contain, collect and dispose of hazardous material spills at all hazardous material storage sites.

#### Waste Management

87. Foothills should utilize appropriate conservation practices to minimize the quantities of waste generated.

88. Foothills should select raw materials which will minimize the generation of toxic and hazardous wastes.

89. Foothills should segregate wastes at source, where practicable, to facilitate disposal.

90. Foothills should reclaim, reuse and/or recycle wastes where practicable.

91. Foothills should minimize the environmental impact of liquid waste discharges by prudent consideration of location, quantity, quality, duration and timing of the discharges.

92. Foothills should plan, develop and operate liquid and solid waste and wastewater management and treatment facilities in accordance with the British Columbia Pollution Control Objectives.

93. Foothills should locate and operate solid waste disposal sites in a manner as to have minimal effect on natural drainage patterns and runoff and on groundwater and surface water quality.

94. Foothills should report scavenging of garbage by dangerous wildlife, such as bears, to the nearest B.C. Fish and Wildlife Office.

#### Granular Materials, Borrow Pits and Quarries

95. Upland borrow sources should be selected in preference to floodplain sources wherever possible.

96. Foothills should locate borrow pits so as to avoid fox, wolf, and bear denning areas.

97. In developing access to borrow pits, Foothills should use existing roads, trails, and cut lines wherever possible.

98. Where permission is granted pursuant to term and condition 121 to open a borrow pit on a floodplain, Foothills should construct

dykes and other works to minimize the possibility that the stream or river might change its course through the pit. Where practicable a 100 m buffer zone should be left between the channel zone and the pit.

99. In operating borrow pits Foothills should:

- (a) stockpile materials stripped or removed to expose granular materials so as to permit their reuse in rehabilitation;
- (b) conduct pit operations to achieve optimum and efficient use of the available materials without exploiting the higher grade materials unnecessarily; and
- (c) take measures to minimize groundwater interference and permafrost degradation.

100. Foothills should take measures to control noise arising from borrow pit operations in order to avoid adverse impact on animals or birds in the areas of land and waterbodies and during the periods of time in respect of those areas set out in the list referred to in term and condition 70.

#### Blasting

101. If blasting near waterbodies containing fish or aquatic animals is necessary, Foothills should take measures to protect such fish or aquatic animals. Such measures may include scheduling to avoid fish sensitive periods; maintaining a distance of 300 m from areas in which concentrations of fish eggs are present, restricted areas where fish are spawning or overwintering or areas where fish are migrating in concentrated schools; temporarily blocking fish access to blast areas; using minimum charges necessary; using blast deflectors or absorbers; and instituting appropriate suspended sediment controls.

#### Water Crossings

102. Foothills should:

- (a) design water crossings to withstand floods of the recurrence intervals recommended by the designated officer;
- (b) take into account in designing the pipeline:
  - (i) water levels that might arise because of ice jamming, storm surges, channel migration or other meteorological or hydrological phenomena;

- (ii) scour; and
- (iii) river icing; and
- (c) submit all supporting data and computations that have been used to estimate flood levels, velocities and scour depth used in the design of water crossings.

103. Foothills should:

- (a) avoid water crossings adjacent to confluences wherever possible;
- (b) avoid lakes where possible and minimize the number of water crossings to protect aquatic resources;
- (c) select water crossings so as to minimize shore erosion, slope instability, and shore and bank disturbance; and
- (d) cross streams at straight and stable reaches where possible. Locate crossings of floodplains and channel zones where they will be as short as practicable.

104. Foothills should in any stream or waterbody which is listed as fish or wildlife habitat pursuant to term and condition 70 or 76 and in which groundwater contributes significantly to winter flow, both in and under the bed, take measures satisfactory to the designated officer to maintain adequate winter groundwater and channel flow in such stream.

105. Where a buried river crossing could cause major environmental damage, Foothills should consider overhead crossing designs.

106. Where river training structures are necessary, Foothills should locate these so as to minimize environmental disturbance.

107. (1) Foothills should design, construct, and operate water crossings, approaches and water diversion channels to minimize any increases in erosion and siltation.

(2) Where necessary, Foothills should construct settling basins on approaches to crossings to control entry of suspended sediments to waterbodies.

(3) Foothills should develop special designs to control erosion at particularly sensitive crossings.

108. On completion of pipeline stream crossings where natural stream action is not likely to restore the stream bed to its original condition Foothills should so restore it by backfilling with the original or equally stable materials.

109. During construction in floodplains, Foothills should avoid the concentration of runoff and the creation of channels along the pipeline.

110. In complying with term and condition 128 Foothills should evaluate the effectiveness of erosion control measures and maintenance of bank stability and observe changes in scour depth, stream bed morphology, and sediment type.

#### Water Withdrawal, Water Discharge and Hydrostatic Testing

111. Foothills should include in its water withdrawal plans measures to stabilize both the stream bed and approaches to the water source so that accelerated erosion will not occur during equipment installation, use, and abandonment.

112. Foothills should:

(a) Not remove water from a waterbody unless it can be demonstrated that this withdrawal will not be detrimental to fish, waterfowl or aquatic mammal populations and habitats in and around the waterbody, either at the time of removal or at a subsequent time. The initial assumption is that all waterbodies are frequented by fish;

(b) Design intakes to conform with the specifications outlined in WATER INTAKE FISH PROTECTION FACILITIES, available from Fisheries and Oceans Canada, Pacific Region; and

(c) Avoid groundwater withdrawals where the groundwater is important for the survival of overwintering fish or aquatic mammals.

113. If the approved minimum flow or depth of water in the stream or lake is reached during a water withdrawal, Foothills should terminate the extraction of water. Foothills should resume water withdrawal only when flow or water levels exceed approved minimum values.

114. Foothills should station an individual qualified to supervise water withdrawal operations at the withdrawal site at all times during withdrawals of water used for pipeline testing, and assign such individual authority to stop water withdrawal.

115. If water is used as a test liquid, Foothills should test this liquid to ensure that B.C. Pollution Control Objectives are met and, if necessary, treat the water to remove any harmful additives prior to discharging it. Foothills should discharge the test fluid effluent at rates which will not increase the flow of the receiving water by more than 10% at the time of discharge.

116. Foothills should not discharge into any waterbody effluent from pipe testing that is toxic to aquatic fauna. Procedures for toxicity testing may include provisions similar to those outlined in PETROLEUM REFINERY EFFLUENT REGULATIONS AND GUIDELINES published by Environment Canada (EPS 1-WP-74-1).

117. If methanol is used as a freezing point depressant, Foothills should carry out final disposal in a manner not harmful to aquatic life.

118. Foothills should consult with the B.C. Water Management Branch with respect to the avoidance of adverse effects of its water withdrawals on other water license holders.

#### Roads and Other Facilities

119. Foothills should design permanent access roads and associated structures in accordance with the requirements of the Government of the Province of British Columbia and locate these wherever practicable so that an undisturbed buffer zone at least 100 m wide remains between roads and waterbodies.



120. Foothills should remove culverts and suitably breach the pad of any right-of-way travelling surface no longer required for pipeline maintenance to allow annual runoff without causing accelerated erosion or ponding.

121. Foothills should exercise the same care in locating temporary access roads as permanent ones and should maintain cross-drainage and minimize disturbance to vegetation. On abandonment, and if instructed to do so, Foothills should remove any culverts, contour the roadbed to restore natural drainage, and block access. Temporary access roads should be located and constructed in consultation with regional officials of the Provincial Government.

122. Foothills should exercise care in locating snow access roads, minimizing disturbance to vegetation (when clearing for right-of-way), and in preparing for spring runoff by breaching. Foothills should clean up any materials used in construction.

123. Foothills should avoid the use of timber in the construction of ice bridges and should locate ice bridges to minimize approach grades and to avoid cuts in river and stream banks. In areas where significant numbers of overwintering fish or eggs are present, Foothills should maintain natural stream flows and minimize siltation.

#### Machinery, Transportation and Construction Equipment

124. Foothills shall operate road vehicles only on public roads and suitably prepared access roads or work surfaces on lands under permit for pipeline-related use.

125. Foothills should schedule its vehicle operation on the right-of-way and on access roads leading to the right-of-way to reduce, as far as practicable, adverse effects on wildlife.

126. Foothills should operate all vehicles and machinery with particular care so as to avoid unnecessary disturbance to the environment. Foothills should minimize vehicle and machinery movements near waterbodies to avoid undue siltation of the water.

127. Foothills should specify in all aircraft contract orders pursuant to guideline 41 having at all times full regard for air flight rules and regulations.

### Inspection and Monitoring

128. Foothills should develop programs, in co-operation with the Agency, to outline methods, frequency, timing and reporting procedures to be followed in inspecting and monitoring the environmental impact of the pipeline. Monitoring programs form a basis for plans for emergencies and require careful integration with emergency measures.

129. Foothills should include in the monitoring program:

- (a) slope stability;
- (b) erosion control;
- (c) thaw settlement;
- (d) water quality (waste treatment and receiving waters);
- (e) water withdrawal, water discharge and hydrostatic testing;
- (f) river and stream crossings;
- (g) drainage structures;
- (h) revegetation;
- (i) wildlife and wildlife habitat;
- (j) fish and aquatic habitat;
- (k) noise levels;
- (l) air quality; and
- (m) handling and losses of fuel and hazardous material.

### Emergency Measures

130. Foothills should establish strategies and procedures relating to, but not limited to the following:

- (a) containment and clean up of spills of fuel, toxic hydrostatic testing material, and other hazardous material assuming the worst case situation with respect to the sensitivity of the site, weather conditions, quantity of material involved, and the direction of spill flow;
- (b) unusual and substantial fish migrations and wildlife movements that could be placed at risk by pipeline-related activities;
- (c) pipe failures, pipeline system malfunctions or potential malfunctions arising from such occurrences as earthquakes, slope failures, washouts, floods or forest fires, to ensure that repair

or other emergency measures make due allowance for sensitive components of the environment; and

(d) major unplanned discharges of water during hydrostatic testing.

131. Foothills should identify potential disposal sites for any contaminated materials likely to be generated by construction or operation of the pipeline and document their surface and subsurface conditions. Foothills should develop detailed site-specific procedures for use of these sites, including the burning, burying and recycling of contaminants and contaminated debris.

132. Foothills should establish fire prevention and suppression methods including:

(a) employment education and training;

(b) operation and maintenance of equipment;

(c) conduct of all pipeline activities associated with burning to minimize fire hazard, with special attention given to preventive measures in summer;

(d) restriction of personnel and curtailment of activities during periods of high risk;

(e) protection of lands under company permits;

(f) fire detection and reporting procedures that take into account existing practices; and

(g) placement of necessary equipment and the availability of properly stockpile areas and all lands adjacent to the pipeline right-of-way and availability of on-site personnel of both Foothills and its contractors to fight fires, if required.